

REMARKS

In the Office Action dated 01/18/01, the Examiner rejected all the claims under 35 USC 112, first paragraph. Applicant apologizes for not responding to the 112, first paragraph rejection in the prior responses. But, Applicant does so now.

Regarding the 112, first paragraph, rejection of all the claims:

(using the same numeral identifiers from the Office Action)

3. For claims 1 and 11 the Examiner states that the specification does not adequately describe the (especially) “determine distribution of the packets to the route processing engines” and the “the distribution being such that an original packet flow comprising the packet(sic) is preserved.”

In response the claims have been amended as follows:

A. The preamble has been modified to include “wherein the packets originate at a source and are returned to a destination, both source and destination external with respect to the routing system.”

From the originally filed specification on page 8, line 5 et seq.:

Data transfer originates at either the individual data interface component 10 or the internet 70Once processing is complete, the data is transferred back through the Xbar 40 to its final destination, either the internet 70 or an individual data interface component 10.

This gives meaning and enablement to the added language in the preamble and “original” as used in the claim.

B. Still with respect to claim 1, the “mechanism that performs a hashing function” element now reads that the hashing looks at the network layer information to determine an “approximately” even distribution and that the route processors will process.

From the originally filed application on page 12, lines 16 et seq.:

The hash function distributes packets evenly among the processors in response to flow information such as the source/destination address, the source/destination port, and the protocol. The hash function can operate using any information that will allow for flow preservations.

The original application describes a hash function to determine an even distribution of the packets, but making sure that packets within the same flow are sent to the same processor so that the original order in each ordered flow is maintained. The way the original packet flow is “preserved” is by sending the packets in the same flow to the same processor. This is well described in the original application. Also, see page 12, lines 4-19. With reference to page 12, lines 12-19, the hash uses any information “source/destination address, port, and the protocol” that allows identifying a flow (that must be so) so that the flow (the order of packets within a flow) may be preserved. The hash function is described on page 13, lines 1-13. “Hashing” is a well known approach to breaking up a long chain of items, say packets, into groups that can be more easily processed in the smaller groups. Hashing techniques are well known in the art, for example the term is well defined in the Encyclopedia of Computer Science, published in 1993 (predecessors in print since 1976), by Van Nostrand Reinhold.

This supports and enables the mechanism for hashing.

C. Next in the claim there is a function of identifying packets belonging to a flow by looking at specifically at the source/destination and the protocol information that is found in the network layer information. This is supported and enabled as described above. There is the phrase in the next section of the claim “and their original order.”

This is supported and enabled as follows:

From the originally filed specification on page 12, lines 6/7:

“...so to maintain the original ordering of packets within the same flow.”

This “original ordering” is supported and enabled in the originally filed specification in many other places. For example, see page 3, line 3; page 5. Line 19.

D. Next there is added “means for determining packets belonging to a same flow.” This is to make the claim clear that packets in the same flow are identified so that they can be handled by the routing system to maintain the ordered packet flow. This is also supported and enabled as described above

E. And, this different handling is found in the last element, “means for preserving.” Again this is enabled and supported by the same excerpt noted above.

With respect to claim 1, as now amended, the claim is clear in operation, no new matter is added, and the claim now operates as enabled in the specification.

F. Claim 11 has been modified similarly to the above amendment to claim 1, and the same support and arguments apply. Moreover, the other claims having the same problems have been amended in accordance with the above changes.

3. (continued) With respect to the 112 first paragraph issue with claim 6:

the limitations of claim 6 and claim 2, before this amendment, have been added into claim 1. The issue of the “uplink connection” using the hash function, as objected to by the Examiner, no longer exists.

3. (continued) With respect to the 112 first paragraph issues with claims 17, 26, and 35:

the “preserving an original packet flow” have been addressed by changes and arguments similar to that of claim 1 above. In addition the word “flow” has been deleted from the phrase “network layer flow information” in all claims. Network layer information is well known in the art and it suitable for standing alone.

3. (continued) With respect to the 112 first paragraph issues of claims 21, 30 and 39:

the Office Action states that the “table containing entries for use in selecting the one processing engine and selecting one entry in the table specified by an index value being based upon the hash function value” is not enabled in the original application. In particular, the Office Action states that the “use in selecting the one processing engine” is not described in the specification. The “one processing engine” in these claims is found in the parent claims. As described above, the way to preserve the ordering of the packets

in a flow is by keeping the related packets together and sending the same flow packets to the same route processor. This approach is clear and enabled in the original application and now in the amended claims with respect to the portions of the original application referenced above. Therefore the hash function, when applied to a portion of the header/layer information that is identical for packets belonging to the same flow, will produce the same value since the information is the same by definition. The “hash” by definition is simply an equation applied, in this case, to a portion of the header data. The same result can be used as an index into a table and therefor to a given processor. Thus a processor that is to receive all the packets of a given flow may be addressed via a table using an index into that table (whose contents identifies a processors) again since all the packets of the same flow are sent to the same processor. The addition of selecting via the table is also added to the claim to further enable and make clear the relationship. The originally filed application described hashing a portion of the packet information.

Page 12, lines 12-13, describes,

“...analyzes router system traffic and distributes flows to multiple processors. The distribution is partly table driven...”

- It is respectfully submitted that such language “The distribution is partly table driven” is well known in the art and means that the processors to which the flow is being distributed are each accessed by indexing into a table. It is respectfully suggested that such a term needs no further definition. As in the discussion above, the hash function will result in the same value for the same flow packets and that value can be used as an index into a table (table driven) where the respective table contents identifies the same

processor, in this case for the same flow packets. Many sources, including the above Encyclopedia, use and describe "table driven."

4. and 5. The Office Action also rejected the claims based on 112, second paragraph. These rejections cited similar phrases as in the 112 first paragraph rejections, and have been similarly corrected herewith.

6. and 7. The Office Action also rejected the claims based on the 35 USC 103(a) citing several references. The primary references are Schnell, U.S. patent no. 5,923,654 ('654), Wilford et al. U.S. patent no. 6,111,877 ('877), Turner et al. U.S. patent no. 6,018,524 ('524), and Varghese et al. U.S. patent no. 5,905,723 ('723).

With respect to '877 (Wilford), this patent application was filed Dec. 31, 1997 and the present patent application was filed April 1, 1998, that is the present application was filed only four months after the '877 application. So the '877 patent qualifies as prior art only under 35 USC 102 (e) and/or (f). However, the '877 patent is assigned to the same assignee as the present application (Cisco Technology, Inc.), and the subject matter of the '877 patent and the present application, when both inventions were made, were both subject to an obligation of assignments to Cisco. Therefore with respect to 35 USC 103 (c), it is respectfully requested that the '877 patent be removed as a reference in the present application.

Schnell in the '654 patent does not recognize or suggest ordered flows that must be preserved. Therefore the '654 patent cannot and does not suggest maintaining those ordered flow.

Since the elements in claims 2 and 6 (before this amendment) have been included in claims 1 and 11 (see below) as now amended, the combinations of the '654, the '524, and the '723 in combination do not disclose or suggest the claims as now amended in the present application. The '654, the '723, and the '524, in combinations, do not disclose or suggest the claims as now amended, especially the evenly distributing hashing, while maintaining ordered flow integrity, routing system and method.

Moreover, the Office Action on page 8 indicates that the groupings of claims 6, 9, 15, 16, 10-20, 22-25, 27-29, 31-34, 36-38 and 40-43 have allowable subject matter. Since claims 10, 13 and 14 were previously cancelled, the applicant takes the possible allowance of 11, 12, and 15-20 as being intended.

With respect to claim 6 (now deleted), it is noted that claim 6 depended from claim 2 that depended from claim 1. As now amended the limitations of the claims 2 and 6 (as not amended as herein) have been included in claim 1 as now amended, therefore as now amended claim 1 and those that depend from claim 1 are now allowable.

With respect to claim 9, it is noted that claim 9 depends from claim 1. Thus, as now amended claim 1 is allowable, and therefor 9 is now allowable.

With respect to claims 12 and 15, it is noted that they depends from claim 11, and claim 16 depends from 15. Therefore as now amended claim 11 and those that depend from claim 11 are now allowable.

With respect to claim 22, it is noted that claim 22 depends from claim 17. All the limitations of claim 22 have been added to claim 17, therefore as now amended claim 17 and those that depend from claim 17 are now allowable. In particular claim 21 is amended to overcome the first paragraph of section 112 objections, and so claim 21 that depends from claim 17 is allowable.

With respect to claim 27, it is noted that claim 27 depends from claim 26. All the limitations of claim 27 have been added to claim 26, therefore as now amended claim 126 and those that depend from claim 26 are now allowable.

With respect to claim 31, it is noted that claim 31 depends from claim 26, also. Since claim 26, as now amended, is allowable, claim 31 and those that depend from claim 31 are now allowable.

With respect to claim 36 it is noted that claim 36 depends from claim 35. All the limitations of claim 36 have been added to claim 35, therefore as now amended claim 35 and those that depend from claim 35 are now allowable.

With respect to claim 40-43, it is noted that claim 40-43 depend from claim 35. Therefore as now amended claims 40-43 that depend from claim 35 are now allowable.

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The Office Action mailed September 12, 2000 has been carefully considered. The 112 first paragraph and obviousness objections of the present claims as now amended have been overcome. Reconsideration and allowance of the remaining claims, as now

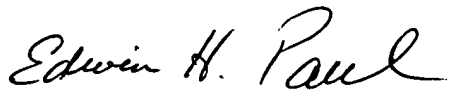
amended, are respectfully requested. The application presents allowable claims and is in a better condition for appeal.

Applicant's attorney notes that he and the Examiner have had several telephone conferences over the last few weeks concerning this application. It is respectfully requested that, if possible, the Examiner call Applicant's attorney to discuss this response and amendment at (617) 951-3040.

It is believed that no additional fee is needed, but, if there is such a charge please charge any additional fee occasioned by this paper to our Deposit Account No. 03-1237.

Respectfully submitted,

4/2/01



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